CANDIDATE AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Eriogonum codium

COMMON NAME: Umtanum Desert Buckwheat

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: February 2002

STATUS/ACTION (Check all that apply):
___ New candidate
_X_ Continuing candidate
    _X_ Non-petitioned
    ___ Petitioned - Date petition received: ___
        ___ 90-day positive - FR date: ___
        ___ 12-month warranted but precluded - FR date: ___
_____ Is the petition requesting a reclassification of a listed species?
    _X_ Listing priority change
        Former LP: 5
        New LP: 2
Latest date species first became Candidate: October 25, 1999
___ Candidate removal: Former LP: ___ (Check only one reason)
    ___ A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
    ___ F - Range is no longer a U.S. territory.
    ___ M - Taxon mistakenly included in past notice of review.
    ___ N - Taxon may not meet the Act's definition of "species."
    ___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Plant; Polygonaceae (Buckwheat Family)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Washington

CURRENT STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Washington

LEAD REGION CONTACT (Name, phone number): Wendi Weber, (503) 231-6131.

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Linda Hallock, Upper Columbia Fish and Wildlife Office, Spokane, Washington, (509) 891-6839.

BIOLOGICAL INFORMATION:

Eriogonum codium was discovered in 1995 during a botanical survey of the Hanford Nuclear Reservation (Reveal et al. 1996). The only known population, consisting of approximately 5,200 plants, exists on Umtanum Ridge in Benton County. The population is restricted to a narrow, discontinuous (scattered distribution) 1.6 kilometer (1 mile) portion of Umtanum Ridge (Dunwiddie et al. 2001). The species grows exclusively on exposed basalt flow material of the Lolo Flow of the Wanapum Basalt Formation. The soils are classified as Lithosols and are composed of fine reddish to blackish basalt overlain with pumice. It is unknown if the association of Eriogonum codium with the Lolo Flow is related to the chemical composition or physical characteristics of the particular bedrock on which it is found, or some other factor. The elevation of the population ranges from 335 to 390 meters (m) (1,100 to 1,280 feet (ft)). Potential locations for additional populations within the lower Columbia Basin were intensively searched during 1996 and 1997, but no other populations have been found.

Eriogonum codium is a long-lived, woody perennial that forms low mats. Individual plants may exceed 100 years of age, based on counts of annual growth rings on cross sections of recently dead Eriogonum codium plants (Dunwiddie et al. 2001; The Nature Conservancy (TNC) 1998). Growth rates also are extremely slow: stem diameters increase an average of only 0.17 millimeters per year (Dunwiddie et al. 2001; TNC 1998).

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Wildfire is a major threat to Eriogonum codium. During the summer of 1996, a fire escaped from the Yakima Training Center (U.S. Department of Army) and traveled eastward for the entire length of Umtanum Ridge. The fire was most severe where shrubs were dense, and ran out of fuel on the rocky face at the east end of Umtanum Ridge. Shrub and grass fuels on parts of Umtanum Ridge are sparse, and the fire was patchy in the area where E. codium is located (Jonathon Soll, pers. comm., 1997). The fire killed an estimated 800 Eriogonum codium, 10 to 20 percent of the entire population (P. Dunwiddie, pers. comm., 2001). The plants appear to be quite sensitive to heat and were easily killed. Plants that were singed, but not visibly charred, appeared to be declining, or died during the year following the fire. The fire did not stimulate vigorous new growth on established E. codium plants, or sprouting from the root crown. There was no apparent flush of seedlings the following spring. This lack of regeneration indicates that the species is not fire adapted (Dunwiddie et al. 2001). The long-term impact of the fire to the population is unknown. The long-term impact of the fire to the population is unknown, but is likely to be significant given low recruitment rates documented for this species.

Dr. Peter Dunwiddie (pers. comm., 2001), a plant population ecologist with TNC, has suggested that fire is the primary threat to the species. Fire may become an even greater threat if the frequency of fires increases (Dunwiddie et al. 2001; TNC 1998). Fires promote the invasion of nonnative species, particularly cheatgrass (Bromus tectorum). The establishment and growth of highly flammable cheatgrass increases the likelihood of fire, influencing the pattern of fire and its

effects on the species.

Fire fighting activities also pose a threat. The location of the population is a natural fire break overlooking steep slopes, and fire lines and fire fighting activities tend to be concentrated in such areas (Heidi Brunkal, Service, pers. comm., 2001)

There has been an increasing incidence of trespassing by off road vehicles (ORVs), hikers, and dirt bikes in the vicinity of and within the Eriogonum codium population (Florence Caplow, Washington Department of Natural Resources, pers. comm., 2001). The open cliff edge where the plants grow is a logical place for human traffic because of the compact substrate, sparse vegetative cover, and the view overlooking the Columbia River. The entire known population is within a narrow strip where human traffic would be concentrated. Eriogonum codium plants are easily damaged by trampling or crushing by ORVs, and extremely sensitive to the resultant damage. Within 2 days of being run over by trespassing dirt bikes, portions of damaged plants showed signs of decline. Some of the damaged plants have since died (TNC 1998).

The collection of petrified wood also threatens the species. Holes up to 1.5 m (5 ft) in diameter and 1.2 m (4 ft) deep dug with a pick-axe and shovel are found throughout the E. codium site (Ted Thomas, Service, pers. obs. 1996). The age of these excavations is unclear. Some may remain from before 1943, when the Department of Energy (DOE) acquired the land as part of the Hanford Nuclear Reservation, now the Hanford Reach National Monument (Monument). Others may result from more recent illegal collectors. Petrified wood is prized by rock-and-mineral enthusiasts, and brings a good price. Collection of petrified wood may be occurring on the Monument, and may increase, even if is illegal. Currently, petrified wood collectors often use heavy equipment for excavation. The use of heavy equipment would pose greater adverse impacts to the species than collecting with a pick-axe and shovel. Collection of petrified wood on this site could threaten a large part of this population.

Another possible threat is a new powerline that the Bonneville Power Administration is proposing to go across the Monument area, which would impact populations of E. codium. The final Environmental Impact Statement (EIS) is due to be published perhaps as early as May or June 2002, and construction on the powerline could take place in the fall of 2002. An indirect impact to the species and its habitat as a result of this project would be the possible introduction of noxious weeds, primarily knapweed (Centaurea spp.) (H. Brunkal, pers. comm., 2002).

B. Overutilization for commercial, recreational, scientific, or educational purposes.

There is no evidence of collection, recreational, scientific, and educational use of this species.

C. Disease or predation.

Researchers from TNC observed western harvester ants (Pogonomyrmex occidentalis), a common native species, gathering mature E. codium achenes (seeds) of Eriogonum codium, and transporting them to their underground colonies (P. Dunwiddie, pers. comm., 2001). Ants brought up and discarded the inedible remains of the achene above ground near the colony. The

percentage of achenes consumed by ants and other insects, and thus the degree of impact insects are having on the available seed bank, is unknown. No seedlings have been seen near the ant colonies. Ant predation of seeds has proved to be a significant factor in the viability of at least one other rare Eriogonum taxon (E. umbellatum var. torreyanum) (P. Dunwiddie, pers. comm., 2001; TNC 1998). Other disease and predation interactions are unknown, as the species' existence has been known for only 7 years.

D. The inadequacy of existing regulatory mechanisms.

Eriogonum codium is currently listed as endangered by the Washington Department of Natural Resources Natural Heritage Program (1997). However, no legal protection of the species or its habitat accompanies this designation, as Washington State does not have an Endangered Species Act for plants.

E. Other natural or manmade factors affecting its continued existence.

The plant community and the habitat in which Eriogonum codium is found was altered by fire during 1996 (Dunwiddie et al. 2001). One consequence of fire, or any disturbance that removes native plants from the shrub-steppe communities of eastern Washington, is the displacement of native vegetation by nonnative weedy species, particularly cheatgrass. As a result of the 1996 fire, a higher percent cover of weedy plant species, including cheatgrass, grows within and around the E. codium population.

The typical size distribution of perennial plants consists of more individuals in smaller size-classes than in larger ones. Eriogonum codium, however, has fewer plants in smaller size-classes than in larger size-classes. This species is dominated by mature plants with little successful establishment of seedlings. During the period from 1997 to 2001, only one seedling in monitoring plots was observed to survive longer than 1 year, although adult mortality is low, averaging 2 percent annually (Dunwiddie et al. 2001). This indicates a problem with the establishment and survival of seedlings. The factor(s) responsible for the lower than expected number of seedlings is not known. Possible factors include low seed production, low seed or pollen viability, low seedling vigor and survival, and insect predation of seeds. Long-term monitoring and research may determine the cause of this skewed size distribution.

Private lands immediately to the west of Umtanum Ridge and surrounding much of the rest of the Hanford site have been converted from shrub-steppe into irrigated agricultural lands. The potential for expansion of the species is therefore restricted.

The Service plans to publish a notice of intent to prepare an Environmental Impact Statement for managing the Monument in the near future. Although public scoping has not formally begun, the public has expressed tremendous interest in the recreational opportunities for this area, including hiking, biking, and hang-gliding (H. Brunkal, pers. comm., 2002). This increased recreational use may increase the threats to the species as a result of habitat disturbance and trampling, as discussed under Factor A.

Ownership of the area where Eriogonum codium is located was transferred from DOE to the Service and is now part of the Monument. The entire Monument will eventually be managed by the Service, but the Service does not currently manage all parts of the Monument. Monument staff have expressed concerns about the potential presence of unexploded ordnance in some areas of the Monument, including the vicinity of some E. codium sites. Until this issue is resolved, the Service has not taken on the responsibility of management of these areas, which continue to be managed by the DOE (H. Brunkal, pers. comm., 2002).

BRIEF SUMMARY OF REASONS FOR LISTING PRIORITY CHANGE:

We have concluded that the magnitude of the threats to the species is high and are of an imminent nature, based on the high level of adverse effect likely to result from fire, human disturbance, the increased likelihood that these disturbances could occur with the change of ownership from DOE to the Service, and the current extremely low rate of reproduction (Dunwiddie et al. 2001). Therefore, we are changing the listing priority number from 5 to 2.

FOR RECYCLED PETITIONS:

a. Is listing still warranted? __
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? __
c. Is a proposal to list the species as threatened or endangered in preparation? __
d. If the answer to c. above is no, provide an explanation of why the action is still precluded. __

LAND OWNERSHIP:

The entire known range of the species is on federally owned land in the Hanford National Monument.

PRELISTING:

During 1997, a National Fish and Wildlife Foundation grant was awarded to the Service, in partnership with TNC of Washington to inventory and study the population. Initial inventory work was accomplished in 1997. The population was mapped, and 24 permanent sample plots were established in the largest subpopulation. Growth-rate studies of this long-lived species were begun. Individual plants were tagged for a demographic study to observe the expansion of adult plants and the regeneration and establishment of seedlings.

The permanent plots were monitored from 1998 through 2001 by TNC, Washington Natural Heritage Program, Calypso Consulting, and volunteers. Continued annual monitoring is planned.

REFERENCES:

Reveal, J.L., F.E. Caplow, and K.A. Beck. 1996. Eriogonum codium, a new species from

southeastern Washington. Rhodora Vol. 97. no. 891.

Caplow, F.E. and K.A. Beck. 1996. A rare plant survey of the Hanford Nuclear Reservation. The Nature Conservancy of Washington, Seattle, Washington.

The Nature Conservancy of Washington. 1998. Final Report. Conservation of two new Plant Species. Report on file at Western Washington Office, Olympia, Washington. 10 pp.

Dunwiddie, P.W., K.A. Beck, and F.E. Caplow. 2001. Demographic studies of Eriogonum codium Reveal, Caplow & Beck (Polygonaceae) in Washington. In Conservation of Washington's Rare plants and ecosystems: Proceedings from a conference of the Rare Plant Care and Conservation Program of the University of Washington. Washington Native Plant Society. Seattle, WA.

LISTING PRIORITY (place * after number)

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2*
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, annual retentions of candidates, removal of candidates, and listing priority changes.

Approve: Rowan Gould March 30, 2002
Acting Regional Director, Fish and Wildlife Service Date

Concur: Steve Williams June 3, 2002
Director, Fish and Wildlife Service Date

Do not concur: _____ _____
Director, Fish and Wildlife Service Date

Director's Remarks: _____

Date of annual review: February 2002

Conducted by: L. Hallock, T. Thomas

Changes from October 29, 2001 CNOR (check one) Yes X No____

Approve: _____ _____
Regional Director Date

Comments: _____

(rev. 1/02)